Innovation Park Water- Progress Report XI

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Objectives: Finish construction of the entire device and complete testing.

Materials and Methods

Progress:

For the past two weeks, alterations to the design of the water filter have made made to make it as efficient as possible. More testing was also done. The first change to the filter was to add some insulation around the first chamber. This was done because the water vapor was condensing all on the inside of the first chamber before it passed through the condenser coil. Packaging bubble wrap was used as the insulator, as shown in Figure 1. The insulator kept the plastic pieces from being cooled down by the outside room temperature. In order to place the insulation in the necessary places, the second chamber had to be taken apart. The second chamber chamber still functions properly, it just no longer has all the plastic pieces surrounding it. The insulation also helped the pressure in the first chamber increase quicker because the first chamber was no longer being cooled down by the room temperature air. Another problem preventing the vapor from condensing in the coil was that the coil had a small hole by the entering end for the vapor. This made it so the vapor would escape through the hole instead of pass completely through the coil. The hole was covered with a piece of tape to prevent the vapor from escaping through the hole. The coil was also not curve downwards the entire way through. Part of the coil at one point curved back upwards, trapping the condensed water vapor at that point. The coil was stretched out more to prevent this from happening. Multiple trials were conducted, but the trials were not successful until the last one. After multiple trials of testing, the first chamber fell apart. Two factors contributed to this. One was that the glue was not able to withstand being heated up and cooled down for that many consecutive times. The second factor was since the glue was weakened due to being reheated and cooled again and again, the pressure being built up in the first chamber caused the plastic pieces to separate. Water started to leak out

during testing, so the trial was cut short. Epoxy putty was applied to the outside, but water continued to leak out during testing.

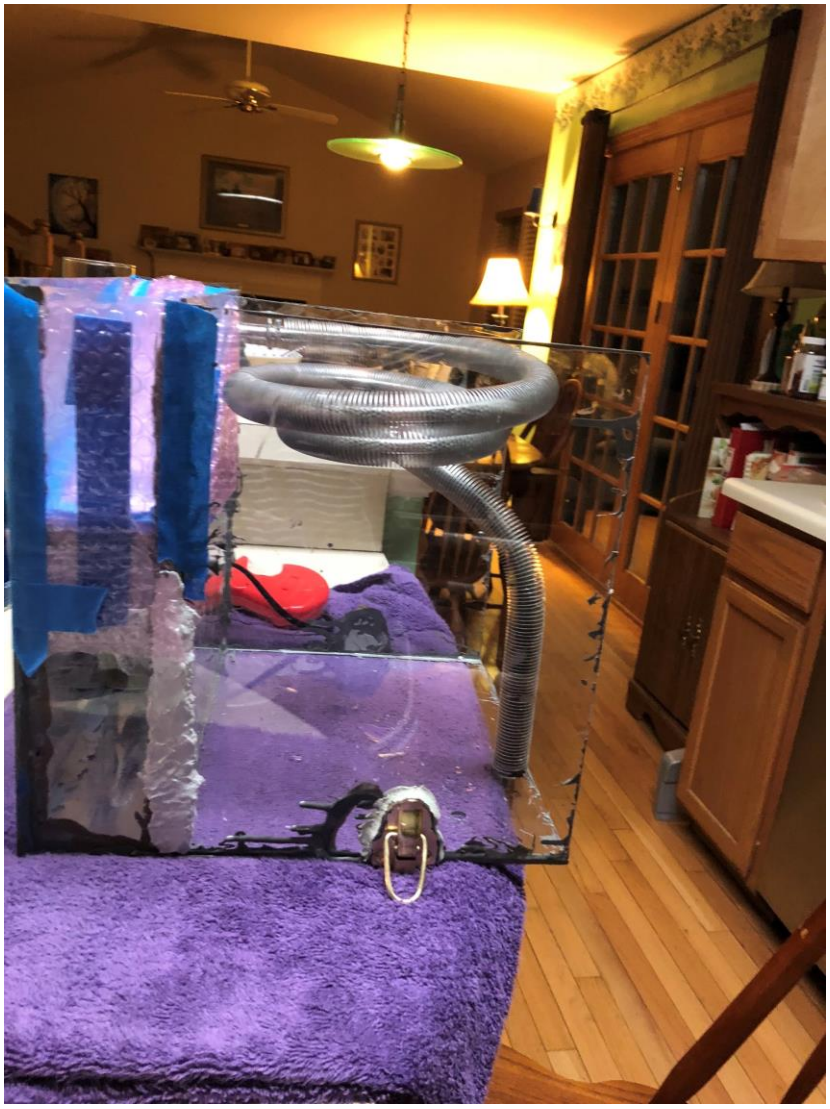

Figure 1: This image shows the insulation that was placed around the first chamber to prevent condensation on the inside.

Work Planned Over the Next Two Weeks:

Over the remaining weeks, a PowerPoint presentation will be put together outlining the entire project and will be presented to the class in a final oral presentation. An abstract will be written and submitted with a detailed report on the errors, data, procedure, and data analysis of the project. Since neither member will be at Symposium, a board and any items that will be displayed on a table will be put together so set up will be quick and efficient in the case that someone else needs to set up or take down the project. Since the previous weeks were focused on data collection and problem assessment, the website was not continuously updated; over the next couple of days, everything will be uploaded to the website for easier viewer access.

Data and Results

The device together was tested and the values of the water purity are shown below. The initial value is within the range for the purity of tap water, which is what was used. The final value is the value for natural spring water, which is more pure than household tap water. This proved that the idea of boiling water and condensing the vapor is successful in purifying water. It took 5 minutes for the water to boil, and averaged about an hour to get a cup of water. This was slower than anticipated because most other water purifier designs similar to this design take just about as much time. The goal was to limit the time, but the time was not limited as much as initially planned.

Type of water	Before purification (PPM)	After purification (PPM)	Time taken to purify one cup (minutes)
Tap water	248	80	58

Table 1: This table shows the change in water purity before entering the purification device and after exiting the second chamber. The ppm shows that the water is more pure, containing less chemicals than when it enter the first chamber. The time is allows the efficiency to be tested and compared to other devices to see if this design creates significant changes.

References

No new references at this time.